AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of estimating the Doppler spread of a radio signal, the method comprising:

receiving a radio signal;

deriving a value for the derivative of the envelope of the path transfer function for said radio signal; and

computing an estimate of the Doppler spread of said radio signal from said derivative value.

2. (Currently Amended) A method according to claim 1, wherein said value for the derivative of said envelope is derived by low-pass filtering an envelope signal representing the path transfer function envelopepath transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter.

3. (Original) A method according to claim 2, wherein said envelope signal comprises a sequence of samples representing the path transfer function envelope.

4. (Original) A method according to claim 1, wherein the computing of said estimate of the Doppler spread comprises determining the variance of said derivative value.

5. (Original) A method according to claim 4, wherein the computing of said estimate of the Doppler spread comprises determining a value indicative of the received power of said radio signal.

6 (Original). A method according to claim 5, wherein the Doppler spread estimate is calculated by determining the square root of the result of dividing twice said variance by said value indicative of the received power of the radio signal.

7. (Currently Amended)   A method according to claim 1, wherein the Doppler spread estimate is calculated in accordance with the formula[[:-]] :

$$Doppler\ spread \propto \sqrt{\frac{2\hat{b_2}}{\hat{b_0}}}$$

where

$$\hat{b_2} = \frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}^{2} - \left(\frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}\right)^2$$

and

$$\hat{b_0} = \frac{1}{2N}\sum_{n=1}^{N}r_{nT}^{2}$$

where r is the magnitude of the radio signal.

8. (Currently Amended)   A method of estimating the speed of a mobile station in a wireless communication system, the method comprising[[:-]] :

    receiving a radio signal;

    deriving a value for the derivative of the envelope of the path transfer function for said radio signal;

    computing an estimate of the Doppler spread of said radio signal from said derivative value; and

    deriving a value for the speed of said mobile station from said Doppler spread estimate.

9. (Original)   A method according to claim 8, wherein said value for the derivative of said envelope is derived by low-pass filtering an envelope signal representing the path transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter.

10. (Original) A method according to claim 9, wherein said envelope signal comprises a sequence of samples representing the path transfer function envelope.

11. (Original) A method according to claim 9, wherein the computing of said estimate of the Doppler spread comprises determining the variance of said derivative value.

12. (Original) A method according to claim 11, wherein the computing of said estimate of the Doppler spread comprises determining a value indicative of the received power of said radio signal.

13. (Original) A method according to claim 12, wherein the Doppler spread estimate is calculated by determining the square root of the result of dividing twice said variance by said value indicative of the received power of the radio signal.

14. (Currently Amended)   A method according to claim 8, wherein the Doppler spread estimate is calculated in accordance with the formula[[:-]] :

$$Doppler\ spread \propto \sqrt{\frac{2\hat{b}_2}{\hat{b}_0}}$$

where

$$\hat{b}_2 = \frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}^2 - \left(\frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}\right)^2$$

and

$$\hat{b}_0 = \frac{1}{2N}\sum_{n=1}^{N}r_{nT}^2$$

where r is the magnitude of the radio signal.

15. (Currently Amended)   A method according to claim 8, wherein the speed of the mobile station is calculated in accordance with the formula[[:-]] :

$$speed \propto \frac{f_{d_{spread}}}{f_c}$$

where $f_{dspread}$ is the Doppler spread and f_c is the carrier frequency of said radio signal.

16. (Currently Amended)   A method of estimating the speed of a mobile station in a wireless communication system, the method comprising [[:-]] :

    receiving a radio signal;

    deriving first and second values for the derivative of the envelope of said radio signal;

    computing first and second estimates of the Doppler spread of said radio signal from said derivative values; and

deriving a value for the speed of said mobile station from said Doppler spread estimates.

17. (Currently Amended)   A method according to claim 16, wherein said first value for the derivative of the envelope of said radio signal is derived by ~~derived by~~ low-pass filtering an envelope signal representing the path transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter and said second value for the derivative of the envelope of said radio signal is derived by low-pass filtering an envelope signal representing the path transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter, the first value being derived using a low-pass filter characteristic having a lower cut-off frequency than that of the low-pass filter characteristic used for deriving said second value.

18. (Original) A method according to claim 17, wherein the output of the low-pass filtering for the first value is followed by downsampling.

19. (Original) A method according to claim 17, wherein said envelope signal comprises a sequence of samples representing the path transfer function envelope.

20. (Currently Amended)   A method according to claim 17, wherein the computing of said first and second estimates of the Doppler spread comprises determining the variances of said first and second derivative values, respectively.

21. (Original) A method according to claim 20, wherein the computing of each of said estimates of the Doppler spread comprises determining a value indicative of the received power of said radio signal.

22. (Original) A method according to claim 21, wherein the first and second Doppler spread estimates are calculated by determining the square root of the result of dividing twice the respective variance by said value indicative of the received power of the radio signal.

23. (Currently Amended)   A method according to claim 16, wherein the Doppler spread ~~estimatea~~ estimates are calculated in accordance with the formula [[:-]] :

$$Doppler\ spread \propto \sqrt{\frac{2\hat{b}_2}{\hat{b}_0}}$$

where

$$\hat{b}_2 = \frac{1}{N}\sum_{n=1}^{N}\dot{\hat{r}}_{nT}^2 - \left(\frac{1}{N}\sum_{n=1}^{N}\dot{\hat{r}}_{nT}\right)^2$$

and

$$\hat{b}_0 = \frac{1}{2N}\sum_{n=1}^{N}r_{nT}^2$$

where r is the magnitude of the radio signal.

24. (Currently Amended) A method according to claim 16, comprising deriving first and second speed estimates values from the first and second Doppler spreads, respectively, and selecting the first or second speed estimate value in ~~dependent~~ dependence on the magnitude of the first or second speed estimate value to provide said speed estimate.

25. (Currently Amended) A method according to claim 24, wherein the first and second speed estimate values are calculated in accordance with the formula [[:-]] :

$$speed \propto \frac{f_{d_{spread}}}{f_c}$$

where $f_{dspread}$ is a Doppler spread and f_c is the carrier frequency of said radio signal.

26. (Currently Amended)   A mobile station of a wireless communication network, the mobile station including radio receiver means for receiving a radio signal and outputting a baseband signal and processing means for processing said baseband signal, wherein the processing means is configured for estimating the Doppler spread of a radio signal by deriving a value for the derivative ~~of the envelope~~ of the path transfer function envelope of a radio signal, received by said radio receiver means, and computing an estimate of the Doppler spread of said radio signal from said derivative value.

27. (Original) A mobile station according to claim 26, wherein said processing means is configured such that said value for the derivative of said envelope is derived by low-pass filtering an envelope signal representing the path transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter.

28. (Original) A mobile station according to claim 27, wherein the radio receiver means outputs said baseband signal as a plurality of samples.

29. (Original) A mobile station according to claim 26, wherein the processing means is configured such that the computing of said estimate of the Doppler spread comprises determining the variance of said derivative value.

30. (Original) A mobile station according to claim 29, wherein the processing means is configured such that the computing of said estimate of the Doppler spread comprises determining a value indicative of the received power of said radio signal.

31. (Original) A mobile station according to claim 30, wherein the processing means is configured such that the Doppler spread estimate is calculated by determining the square root of the result of dividing twice said variance by said value indicative of the received power of the radio signal.

32. (Currently Amended)   A mobile station according to claim 26, wherein the processing means is configured such that the Doppler spread estimate is calculated in accordance with the formula [[:-]] :

$$Doppler\ spread \propto \sqrt{\frac{2\hat{b}_2}{\hat{b}_0}}$$

where

$$\hat{b}_2 = \frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}^2 - \left(\frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}\right)^2$$

and

$$\hat{b}_0 = \frac{1}{2N}\sum_{n=1}^{N}r_{nT}^2$$

where r is the magnitude of the radio signal.

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33. (Original) A mobile station of a wireless communication network, the mobile station including radio receiver means for receiving a radio signal and outputting a baseband signal and processing means for processing said baseband signal, wherein the processing means is configured for estimating the speed of the mobile station by deriving a value for the derivative of the path transfer function envelope for a radio signal, received by said radio receiver means, computing an estimate of the Doppler spread of said radio signal from said derivative value and deriving a value for the speed of said mobile station from said Doppler spread estimate.

34. (Original) A mobile station according to claim 33, wherein said processing means is configured such that said value for the derivative of said envelope is derived by low-pass filtering an envelope signal representing the path transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter.

35. (Original) A mobile station according to claim 34, wherein the radio receiver means outputs said baseband signal as a plurality of samples.

36. (Original) A mobile station according to claim 33, wherein the processing means is configured such that the computing of said estimate of the Doppler spread comprises determining the variance of said derivative value.

37. (Original) A mobile station according to claim 36, wherein the processing means is configured such that the computing of said estimate of the Doppler spread comprises determining a value indicative of the received power of said radio signal.

38. (Original) A mobile station according to claim 37, wherein the processing means is configured such that the Doppler spread estimate is calculated by determining the square root of the result of dividing twice said variance by said value indicative of the received power of the radio signal.

39. (Currently Amended) A mobile station according to claim 33, wherein the processing means is configured such that the Doppler spread estimate is calculated in accordance with the formula [[:-]] :

$$Doppler\ spread \propto \sqrt{\frac{2\hat{b}_2}{\hat{b}_0}}$$

where

$$\hat{b}_2 = \frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}^2 - \left(\frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}\right)^2$$

and

$$\hat{b}_0 = \frac{1}{2N}\sum_{n=1}^{N}r_{nT}^2$$

where r is the magnitude of the radio signal.

40. (Original) A mobile station of a wireless communication network, the mobile station including radio receiver means for receiving a radio signal and outputting a baseband signal and processing means for processing said baseband signal, wherein the processing means is configured for estimating the speed of the mobile station by deriving first and second values for the derivative of the envelope of the path transfer function envelope of a radio signal, received by said radio receiver means, computing first and second estimates of the Doppler spread of said radio signal from said derivative value and deriving a value for the speed of said mobile station from said Doppler spread estimates.

41. (Original) A mobile station according to claim 40, wherein the processing means is configured such that said first value for the derivative of said envelope is derived by low-pass filtering an envelope signal representing the path transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter and said second value for the derivative of said envelope is derived by low-pass filtering an envelope signal representing the path transfer function envelope to band limit it and filtering the band-limited envelope signal using an FIR filter, the first value being derived using a low-pass filter characteristic having a lower cut-off frequency than that of the low-pass filter characteristic used for deriving said second value.

42. (Original) A mobile station according to claim 41, wherein the processing means is configured such that the output of the low-pass filtering for the first value is followed by downsampling.

43. (Original) A mobile station according to claim 41, wherein the radio receiver means outputs the baseband signal as a sequence of samples.

44. (Currently Amended) A mobile station according to claim 41, wherein processing means is configured such that the computing of said first and second estimates of the Doppler spread comprises determining the variances of said first and second derivative values, respectively.

45. (Original) A mobile station according to claim 44, wherein the processing means is configured such that the computing of each of said estimates of the Doppler spread comprises determining a value indicative of the received power of said radio signal.

46. (Original) A mobile station according to claim 45, wherein processing means is configured such that the first and second Doppler spread estimates are calculated by determining the square root of the result of dividing twice the respective variance by said value indicative of the received power of the radio signal.

47.(Currently Amended) A mobile station according to claim 40, wherein processing means is configured such that the Doppler spread estimates are calculated in accordance with the formula [[:-]] :

$$Doppler\ spread \propto \sqrt{\frac{2\hat{b}_2}{\hat{b}_0}}$$

where

$$\hat{b}_2 = \frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}^2 - \left(\frac{1}{N}\sum_{n=1}^{N}\hat{r}_{nT}\right)^2$$

and

$$\hat{b}_0 = \frac{1}{2N}\sum_{n=1}^{N}r_{nT}^2$$

where r is the magnitude of the radio signal.

48. (Currently Amended)A mobile station according to claim 40, wherein the processing means is configured for deriving first and second speed estimate values from the first and second Doppler spreads, respectively, and selecting the first or second speed estimate value in ~~dependent~~ dependence on the magnitude of the first or second speed estimate value to provide said speed estimate.

49. (Currently Amended) A mobile station according to claim 48, wherein the processing means is configured such that the first and second speed estimate values are calculated in accordance with the formula [[:-]] :

$$speed \propto \frac{f_{d_{spread}}}{f_c}$$

where $f_{dspread}$ is a Doppler spread and f_c is the carrier frequency of said radio signal.